

CLAIMS:

1. A mirror for light modulators, comprising a light-receiving member, at least one hinge adapted to be provided at an upper end thereof with said light-receiving member, said light-receiving member being flexible, said hinge being adapted to extend below said light-receiving member and being displaceable between deformed and extended positions thereby allowing for at least one of the displacement and the deformation of said light-receiving member.

5 2. A mirror as defined in Claim 1, wherein said hinge comprises at least upper and lower sections defining an angle therebetween, said upper section being connected to said light-receiving member, said upper and lower sections being adapted to pivot relative to one another thereby allowing said angle to vary and thus allowing said light-receiving member to at least one of displace and deform.

10 3. A mirror as defined in Claim 2, wherein there are provided two said hinges disposed symmetrically about a plane extending perpendicularly to said light-receiving member when said light-receiving member is in an unbiased position thereof.

15 4. A mirror as defined in Claim 3, wherein for each said hinge, said lower section is adapted to be mounted to a substrate of the light modulator and said upper section is pivotally connected at a lower end thereof to an upper end of said lower section, said upper section being adapted to be connected at an upper end thereof to said light-receiving member.

20 5. A mirror as defined in Claim 4, wherein for each said hinge, said upper section extends at an angle downwardly and outwardly from said light-receiving member, said lower section extending outwardly from said lower end of said upper section, whereby said upper sections of said hinges diverge from one another as they extend downward.

25 6. A mirror as defined in Claim 5, wherein said upper and lower sections define a hinge angle therebetween, said hinge angle being adapted to be greater when said light-receiving member is in a biased position thereof than when said light-receiving member is in said unbiased position.

30 7. A mirror as defined in Claim 1, wherein said light-receiving member is plane when in an unbiased position thereof, said light-receiving member being adapted when biased to adopt a curved attitude.

8. A mirror as defined in Claim 7, wherein said curved attitude, when said light-receiving member is biased, is a concave attitude.

35 9. A mirror as defined in Claim 1, wherein said light-receiving member has a curved attitude when in an unbiased position thereof, said curved attitude being adapted to change when said light-receiving member is biased.

10. A mirror as defined in Claim 9, wherein said curved attitude, when said light-receiving member is in said unbiased position, is one of a convex and a concave attitude.

11. A mirror as defined in Claim 1, wherein said hinge and said light-receiving member are electrically conductive so that said light-receiving member can be electrostatically actuated.

12. A light modulator comprising a mirror, a substrate provided with at least one electrode, and at least one hinge extending between said substrate and said mirror, said mirror being flexible with said hinge being displaceable for allowing for at least one of the displacement and the deformation of said mirror.
- 5 13. A light modulator as defined in Claim 12, wherein said hinge comprises at least upper and lower sections defining an angle therebetween, said upper section being connected to said mirror, said upper and lower sections being adapted to pivot relative to one another thereby allowing said angle to vary and thus allowing said mirror to at least one of displace and deform.
- 10 14. A light modulator as defined in Claim 13, wherein there are provided two said hinges disposed symmetrically about a plane extending perpendicularly to said mirror when said mirror is in an unbiased position thereof.
- 15 15. A light modulator as defined in Claim 14, wherein for each said hinge, said lower section is mounted to said substrate and said upper section is pivotally connected at a lower end thereof to an upper end of said lower section, said upper section being connected at an upper end thereof to said mirror.
- 20 16. A light modulator as defined in Claim 15, wherein for each said hinge, said upper section extends at an angle downwardly and outwardly from said mirror, said lower section extending outwardly from said lower end of said upper section, whereby said upper sections of said hinges diverge from one another as they extend downward, said electrode being positioned under said mirror and between said lower sections of said hinges.
17. A light modulator as defined in Claim 16, wherein said upper and lower sections define a hinge angle therebetween, said hinge angle being adapted to be greater when said mirror is in a biased position thereof than when said mirror is in said unbiased position.
- 25 18. A light modulator as defined in Claim 12, wherein said mirror is plane when in an unbiased position thereof, said mirror being adapted when biased to adopt a curved attitude.
19. A light modulator as defined in Claim 18, wherein said curved attitude, when said mirror is biased, is a concave attitude.
- 30 20. A light modulator as defined in Claim 12, wherein said mirror has a curved attitude when in an unbiased position thereof, said curved attitude being adapted to change when said mirror is biased.
21. A light modulator as defined in Claim 20, wherein said curved attitude, when said mirror is in said unbiased position, is one of a convex and a concave attitude.
22. A light modulator as defined in Claim 12, wherein said hinge and said mirror are electrically conductive so that said mirror can be electrostatically actuated.
- 35 23. A hinge assembly for supporting a flexible mirror in a light modulator, comprising at least one hinge including first and second arms hingedly connected together, an upper end of said hinge being adapted to be connected to the mirror, said first and second arms of said hinge being V-shaped and defining an apex, said hinge being adapted to extend substantially under the mirror with said apex extending inwardly, said hinge being displaceable between deformed and extended positions thereof, thereby allowing for the displacement and deformation of the mirror.

24. A hinge assembly as defined in Claim 23, wherein there are provided two said hinges.
25. A hinge assembly as defined in Claim 24, wherein said hinges are adapted to be disposed symmetrically under the mirror with said apexes facing each other.
26. A hinge assembly as defined in Claim 25, wherein each said first arm comprises an upper arm and each said second arm comprises a lower arm, said upper arm of each said hinge being adapted to be connected to the mirror.
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27. A hinge assembly as defined in Claim 26, wherein said upper and lower arms of each said hinge define an at-rest angle therebetween, said at-rest angle being adapted to decrease when the mirror is biased.
28. A hinge assembly as defined in Claim 27, wherein a lower end of each said lower arm is adapted to be pivotally mounted to a substrate of the light modulator, said lower arm and the substrate defining a second at-rest angle, said second at-rest angle being adapted to decrease when the mirror is biased as said lower arm pivots and deforms towards the substrate.
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29. A hinge assembly as defined in Claim 24, wherein said first and second arms of each said hinge are pivotally connected together at said apex.
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30. A hinge assembly as defined in Claim 23, wherein said hinge and the mirror are electrically conductive so that the mirror can be electrostatically actuated.
31. A light modulator comprising a flexible mirror, a substrate provided with at least one electrode and at least one hinge connecting said substrate and said mirror, said hinge including first and second arms hingedly connected together, an upper end of said hinge being connected to said mirror, said first and second arms of said hinge being V-shaped and defining an apex, said hinge extending substantially under the mirror with said apex extending inwardly, said hinge being displaceable for allowing for the displacement and deformation of said mirror.
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32. A light modulator as defined in Claim 31, wherein there are provided two said hinges.
33. A light modulator as defined in Claim 32, wherein said hinges are disposed symmetrically under the mirror with said apexes facing each other.
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34. A light modulator as defined in Claim 33, wherein each said first arm comprises an upper arm and each said second arm comprises a lower arm, said upper arm of each said hinge being connected to the mirror.
35. A light modulator as defined in Claim 34, wherein said upper and lower arms of each said hinge define an at-rest angle therebetween, said at-rest angle being adapted to decrease when said mirror is biased.
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36. A light modulator as defined in Claim 35, wherein a lower end of each said lower arm is pivotally mounted to said substrate, said lower arm and said substrate defining a second at-rest angle, said second at-rest angle being adapted to decrease when said mirror is biased as said lower arm pivots and deforms towards said substrate.
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37. A light modulator as defined in Claim 32, wherein said first and second arms of each said hinge are pivotally connected together at said apex.
38. A light modulator as defined in Claim 31, wherein said hinge and said mirror are electrically conductive so that said mirror can be electrostatically actuated.
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